



DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XB918]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to U.S. Navy Construction of the Multifunctional Expansion of Dry Dock 1 at Portsmouth Naval Shipyard, Kittery, Maine

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of an incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an incidental harassment authorization (IHA) to the U.S. Navy (Navy) to incidentally harass, by Level A and B harassment, marine mammals during activities associated with the Multifunctional Expansion of Dry Dock 1 at Portsmouth Naval Shipyard, Kittery, Maine

DATES: This Authorization is effective from April, 1 2022 through March 31, 2023.

FOR FURTHER INFORMATION CONTACT: Stephanie Egger, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: <https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the “take” of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed incidental take authorization may be provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other means of effecting the least practicable adverse impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stocks for taking for certain subsistence uses (referred to in shorthand as “mitigation”); and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

Summary of Request

On September 2, 2021, NMFS received a request from the Navy for an IHA to take marine mammals incidental to construction activities associated with the multifunctional expansion of Dry Dock 1 project (also referred to as P-831) at Portsmouth Naval Shipyard in Kittery, Maine. The Navy submitted a revised version of the application on December 21, 2021. The application was deemed adequate and complete on February 10, 2022. The Navy’s request is for take of harbor porpoises,

harbor seals, gray seals, harp seals, and hooded seals by Level A harassment and Level B harassment. Neither the Navy nor NMFS expects serious injury or mortality to result from this activity; therefore, an IHA is appropriate.

Description of Proposed Activity

The shipyard is located in the Piscataqua River in Kittery, Maine. The Piscataqua River originates at the boundary of Dover, New Hampshire, and Eliot, Maine. Multifunctional Expansion of Dry Dock 1 (P-381) is one of three projects that support the overall expansion and modification of Dry Dock 1, located in the western extent of the shipyard. The previous two projects, construction of a super flood basin (P-310) and extension of portal crane rail and utilities (P-1074) are currently under construction. Work associated with P-310 and P-1074 has been and/or is being completed under the separate IHAs issued by NMFS. The projects have been phased to support Navy mission schedules. P-381 will be constructed within the same footprint of the super flood basin over an approximated 7-year period. In-water activities are expected to occur within the first 5 years, between April 2022 and April 2027. This IHA request is for the first year of in-water construction for P-381 occurring from April 2022 through April 2023. All work beyond year 1 is anticipated to be requested in a rulemaking/Letter of Authorization (LOA) application submission to NMFS.

The purpose of the proposed project, Multifunctional Expansion of Dry Dock 1 (P-381), is to modify the super flood basin to create two additional dry docking positions (Dry Dock 1 North and Dry Dock 1 West) in front of the existing Dry Dock 1 East. The super flood basin provides the starting point for the P-381 work (see Figure 1-2 of the application).

Year 1 construction activities will focus on the preparation of the walls and floors of the super flood basin to support the placement of the monoliths and the construction of the two dry dock positions. The primary work needed to prepare the super flood basin

involves structural reinforcement of the existing berths and floor within the super flood basin, bedrock removal, and demolition of portions of the super flood basin walls. Most of the preparatory work will occur behind the existing super flood basin walls that would act as a barrier to sound and would contain underwater noise to within a small portion of the Piscataqua River (see Figure 1-3 of the application). Construction activities that could affect marine mammals are limited to in-water pile driving and removal activities, rock hammering, rotary drilling, and down-the-hole (DTH) hammering.

The construction activities are anticipated to begin in March 2022 and proceed to March 2023. In-water construction activities would occur for 365 days over a period of approximately 12 consecutive months. All in-water work capable of producing noise harmful to marine mammals will be limited to daylight hours. Pile driving days are not necessarily consecutive and certain activities may occur at the same time, decreasing the total number of in-water construction days. Vibratory pile driving and extraction is assumed to occur during 84 days of Year 1. Impact pile driving will occur during 24 days in Year 1. DTH activities would occur for 919 days and rotary drilling would occur for 282 days. Rock hammering would occur for 252 days. Overlapping activities are estimated to reduce the number of construction days by 1,172 days for a total of 365 construction days. A total of 539 shafts/borings; 2,855 holes/anchors; and 422 sheet piles would occur for this project.

Preparatory work for P-381 in Year 1 as proposed for this IHA can be generally grouped into four categories: center wall support and tie-in, structural reinforcement of super flood basin sidewalls and entrance, mechanical bedrock removal, and demolition of super flood basin wall components. Each category involves one or more activities expected to result in harassment of marine mammals.

A detailed description of the planned project is provided in the **Federal Register** notice for the proposed IHA (87 FR 11860; March 2, 2022). Since that time, no changes

have been made to the planned activities. Therefore, a detailed description is not provided here. Please refer to that Federal Register notice for the description of the specific activity.

Comments and Response

A notice of NMFS's proposal to issue an IHA to the Navy was published in the **Federal Register** on March 2, 2022 (87 FR 11860). That notice described, in detail, the Navy's activity, the marine mammal species that may be affected by the activity, and the anticipated effects on marine mammals. During the 30-day public comment period, NMFS received no public comment or comment letter from the Marine Mammal Commission.

Changes from the Proposed IHA to the Final IHA

No public comments were received during the comment period; however, NMFS made a few minor clarifications and corrections to this final notice and the corresponding IHA. In the sections of the documents that refer to the use of a bubble curtain, it was established that the bubble curtain would be used in cases where the Level A harassment zone extends to the full region of influence (ROI). To clarify this further, NMFS add that this refers to DTH (cluster and mono-hammer), rock hammering, and impact pile driving of sheet piles. Specifically, these include the 78-in cluster and 42-in mono DTH, rock hammering, and impact pile driving of sheet piles for the secant pile guide wall. In addition, for bubble curtains, NMFS clarified that the air flow to the bubblers would be balanced across the entrance openings to the superflood basin, rather than the piles. Finally, NMFS removed the mitigation condition that outlined observers shall work in shifts lasting no longer than 4 hours (hrs) with at least a 1-hr break between shifts and will not perform duties as a observer for more than 12 hrs in a 24-hr period. This is not a required condition for the Navy for these construction activities, rather it is related to seismic surveys but was accidentally included. That said, NMFS communicated to the

Navy that observers should be given adequate breaks and work in shifts to reduce observer fatigue to ensure their ability to best monitor for marine mammals.

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS' Stock Assessment Reports (SARs;

<https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>) and more general information about these species (e.g., physical and behavioral descriptions) may be found on NMFS' website

(<https://www.fisheries.noaa.gov/find-species>).

Table 1 lists all species with expected potential for occurrence in the Piscataqua River in Kittery, Maine, and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, NMFS follows Committee on Taxonomy (2021). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS' SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S.

waters. All managed stocks in this region are assessed in NMFS' U.S. Atlantic Marine Mammal SARs. All values presented in Table 3 are the most recent available at the time of publication and are available in the final 2020 SARs (Hayes *et al.*, 2021) and draft 2021 SARs, available online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports>.

Table 1--Marine mammals with potential presence within the proposed project area

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N) ¹	Stock abundance (CV, N _{min} , most recent abundance survey) ²	PBR	Annual M/SI ³
Order Cetartiodactyla – Cetacea – Superfamily Odontoceti (toothed whales)						
Family Phocoenidae (porpoises)						
Harbor porpoise	<i>Phocoena phocoena</i>	Gulf of Maine/Bay of Fundy	-; N	95,543 (0.31; 74,034; 2016)	851	164
Order Carnivora – Superfamily Pinnipedia						
Family Phocidae (earless seals)						
Harbor seal	<i>Phoca vitulina</i>	Western North Atlantic	-; N	61,336 (0.08, 57,637; 2018)	1,729	339
Gray seal	<i>Halichoerus grypus</i>	Western North Atlantic	-; N	27,300 ⁴ (0.22; 22,785; 2016)	1,389	4,453
Harp seal	<i>Pagophilus groenlandicus</i>	Western North Atlantic	-; N	7,600,000 (unk, 7,100,000, 2019)	426,000	178,573
Hooded seal	<i>Cystophora cristata</i>	Western North Atlantic	-; N	593,500	Unknown	1,680

¹ - Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

² - NMFS marine mammal stock assessment reports online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region#reports>. CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance.

³ - These values, found in NMFS' SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.

⁴ - This abundance value and the associated PBR value reflect the US population only. Estimated abundance for the entire Western North Atlantic stock, including animals in Canada, is 451,600. The annual M/SI estimate is for the entire stock.

All species that could potentially occur in the proposed action area are included in

Table 1. More detailed descriptions of marine mammals in the PNSY project area are provided below.

A detailed description of the of the species likely to be affected by the Navy's project, including brief introductions to the species and relevant stocks as well as

available information regarding population trends and threats, and information regarding local occurrence, were provided in the **Federal Register** notice for the proposed IHA (87 FR 11860; March 2, 2022); since that time, we are not aware of any changes in the status of these species and stocks; therefore, detailed descriptions are not provided here. Please refer to that **Federal Register** notice for these descriptions. Please also refer to NMFS' website (<https://www.fisheries.noaa.gov/find-species>) for generalized species accounts.

Potential Effects of Specified Activities on Marine Mammals and their Habitat

The effects of underwater noise from the Navy's construction activities have the potential to result in Level A and Level B harassment by behavioral disturbance, temporary threshold shift to marine mammals in the vicinity of the project area. The notice of proposed IHA (87 FR 11860; March 2, 2022) included a discussion of the effects of anthropogenic noise on marine mammals and the potential effects of underwater noise from the Navy's construction activities on marine mammals and their habitat. That information and analysis is incorporated by reference into this final IHA determination and is not repeated here; please refer to the notice of proposed IHA (87 FR 11860; March 2, 2022).

Estimated Take

This section provides an estimate of the number of incidental takes proposed for authorization through this IHA, which will inform both NMFS' consideration of small numbers and the negligible impact determination.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal

stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes would primarily be by Level B harassment, in the form of behavioral disturbance, masking, and potential TTS, with a smaller amount of Level A harassment in the form of PTS. As described previously, no mortality is anticipated or proposed to be authorized for this activity. Below we describe how the take is estimated.

Generally speaking, we estimate take by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and (4) the number of days of activities. We note that while these factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.*, previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the take estimate.

Acoustic Thresholds

NMFS recommends the use of acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

Level B Harassment – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.*, frequency, predictability, duty cycle), the environment (*e.g.*, bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et*

al., 2007, Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 microPascal (μPa) (root mean square (RMS) for continuous (*e.g.*, vibratory pile-driving, drilling) and above 160 dB re 1 μPa (RMS) for impulsive and/or intermittent (*e.g.*, impact pile driving, DTH) sources. The Navy's construction includes the use of continuous and impulsive sources, and therefore the 120 and 160 dB re 1 μPa (RMS) thresholds are applicable.

Level A harassment – NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise. The Navy's modification and expansion of Dry Dock 1 includes the use of impulsive (*i.e.*, impact pile driving, DTH) and non-impulsive (*i.e.*, drilling, vibratory pile driving) sources.

These thresholds are provided in Table 2 below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2018 Technical Guidance, which may be accessed at <https://www.fisheries.noaa.gov/national/marine-mammal-protection>.

Table 2--Thresholds identifying the onset of Permanent Threshold Shift for High Frequency Ceteaceans and Pinnipeds

Hearing Group	PTS Onset Acoustic Thresholds* (Received Level)	
	Impulsive	Non-impulsive

High-Frequency (HF) Cetaceans	<i>Cell 5</i> $L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	<i>Cell 6</i> $L_{E,HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	<i>Cell 7</i> $L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	<i>Cell 8</i> $L_{E,PW,24h}$: 201 dB
<p>* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.</p> <p><i>Note:</i> Peak sound pressure (L_{pk}) has a reference value of 1 μPa, and cumulative sound exposure level (L_E) has a reference value of 1 μPa²s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript “flat” is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (HF cetaceans and PW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (<i>i.e.</i>, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.</p>		

Ensonified Area

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds, which include source levels transmission loss coefficient.

Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

$$TL = B * \log_{10}(R_1/R_2), \text{ where}$$

B = transmission loss coefficient (assumed to be 15)

R_1 = the distance of the modeled sound pressure level (SPL) from the driven pile,
and

R_2 = the distance from the driven pile of the initial measurement.

This formula neglects loss due to scattering and absorption, which is assumed to be zero here. The degree to which underwater sound propagates away from a sound

source is dependent on a variety of factors, most notably the water bathymetry and presence or absence of reflective or absorptive conditions, including in-water structures and sediments. Spherical spreading occurs in a perfectly unobstructed (free-field) environment not limited by depth or water surface, resulting in a 6 dB reduction in sound level for each doubling of distance from the source ($20 \cdot \log(\text{range})$). Cylindrical spreading occurs in an environment in which sound propagation is bounded by the water surface and sea bottom, resulting in a reduction of 3 dB in sound level for each doubling of distance from the source ($10 \cdot \log(\text{range})$). As is common practice in coastal waters, here we assume practical spreading (4.5 dB reduction in sound level for each doubling of distance). Practical spreading is a compromise that is often used under conditions where water depth increases as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions. Practical spreading was used to determine sound propagation for this project.

The intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. There are sound source level (SSL) measurements available for certain pile types and sizes from the similar environments from other Navy pile driving projects that were evaluated and used as proxy sound source levels to determine reasonable sound source levels likely to result from the pile driving and removal activities (Table 3). Some of the proxy source levels are expected to be more conservative, as the values are from larger pile sizes. Acoustic monitoring results and associated monitoring reports from past projects conducted at the shipyard and elsewhere were reviewed. Projects reviewed were those most similar to the specified activity in terms of drilling and rock hammering activities, type and size of piles installed, method of pile installation, and substrate conditions.

Table 3--Summary of in-water pile driving source levels (at 10 m from source)

Pile Type	Installation Method	Pile Diameter	Peak (dB re 1 μ Pa)	RMS (dB re 1 μ Pa)	SEL (dB re 1 μ Pa ² sec)
Casing/Socket	Rotary Drill	102-inch ¹	NA	154 m	NA
Shaft	DTH Cluster Drill	78-inch ²	NA	195.2 (Level A) 167 dB (Level B)	181
Casing	DTH mono-hammer	42-inch ¹	194	167	164
Rock anchor	DTH mono-hammer	9-inch ¹	172	167	146
Relief hole	DTH mono-hammer	4 to 6-inch ¹	170	167	144
Z-shaped Sheet	Impact	28-inch ³	211	196	181
	Vibratory	28-inch ⁴	NA	167	167
Flat sheet	Vibratory	18-inch ⁵	NA	163	163
Bedrock and concrete demolition	Rock Hammer ^{6,7}	NA	197	184	175

¹ Egger 2021a.

² Egger 2021b.

³ A proxy value for impact pile driving 28-inch steel sheet piles could not be found so the proxy for a 30-inch steel pipe pile has been used (NAVFAC SW 2020 [p. A-4]).

⁴ A proxy value for vibratory pile driving 28-inch steel sheet piles could not be found so a proxy for a 30-inch steel pipe pile has been used (Navy 2015 [p. 14]).

⁵ NMFS 2019 (p. 24484, Table 5).

⁶ Reyff 2018a

⁷ Reyff 2018b

Notes: All SPLs are unattenuated; dB=decibels; NA = Not applicable; single strike SEL are the proxy sources levels presented for impact pile driving and were used to calculate distances to PTS.

dB re 1 μ Pa = dB referenced to a pressure of 1 microPascal, measures underwater SPL. dB re 1 μ Pa²-sec = dB referenced to a pressure of 1 microPascal squared per second, measures underwater SEL.

All recordings were made at 10 meters unless noted otherwise.

With regards to the proxy values summarized in Table 3, very little information is available regarding source levels for in-water rotary drilling activities. As a conservative measure and to be consistent with previously issued IHAs for similar projects in the region (Egger 2021a; Dazey 2012), a proxy of 154 dB RMS is proposed for all rotary drilling activities.

Rock hammering is analyzed as an impulsive noise source. For purposes of this analysis, it is assumed that the hammer would have a maximum strike rate of 460 strikes per minute and would operate for a maximum duration of 15 minutes before needing to reposition or stop to check progress. Therefore, noise impacts for rock hammering activities are assessed using the number of blows per 15-minute interval (6,900 blows) and the number of 15-minute intervals anticipated over the course of the day based on the

durations provided in Table 2-1 and Table 6-5 of the application. As with rotary drilling, very little information is available regarding source levels associated with nearshore rock hammering. Measurements taken for this activity as part of the Tappan Zee Bridge replacement project recorded sound levels as follows:

- 197 dBpk, 184 dB RMS, 175 dB SEL (Reyff 2108a, 2018b)

Since no other comparable proxy values were identified in the literature, the Navy is proposing to use the same proxy values for rock hammering activities associated with P-381.

The Navy consulted with NMFS to obtain the appropriate proxy values for DTH mono-hammers. With regards to DTH mono-hammers, NMFS provided proxy values of 170 dBpk, 167 RMS, and 144 dB single strike SEL for holes 8-inches in diameter or less (Reyff 2020); 172 dBpk, 167 RMS, and 146 dB single strike SEL for holes 8- to 18 inches in diameter (Guan and Miner 2020); and 194 dBpk, 167 RMS, and 164 dB single strike SEL for holes 24- to 42-inches in diameter (Reyff 2020, Denes *et al.*, 2019 as cited in NMFS 2021a). For the 78-inch DTH cluster drill, NMFS provided an RMS value of 195.2 based off of regression and extrapolation calculations of existing data. Because of the high number of hammers and strikes for this system, cluster drills were treated as a continuous sound source for the time component of Level A harassment but still used the impulsive thresholds. The Level B harassment sound source level at 10 m remained at 167 dB RMS (Heyvaert and Reyff, 2021 as cited in NMFS 2021b).

In conjunction with the NMFS Technical Guidance (2018), in recognition of the fact that ensonified area/volume could be more technically challenging to predict because of the duration component in the new thresholds, NMFS developed a User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. We note that, because of some of the assumptions included in the methods used for these tools, we anticipate that

isopleths produced are typically going to be overestimates of some degree, which may result in some degree of overestimation of Level A harassment take. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 3D modeling methods are not available, and NMFS continues to develop ways to quantitatively refine these tools and will qualitatively address the output where appropriate. For stationary sources (such as from impact and vibratory pile driving), the NMFS User Spreadsheet (2020) predicts the closest distance at which, if a marine mammal remained at that distance the whole duration of the activity, it would not incur PTS. Inputs used in the User Spreadsheet can be found in Appendix A of the Navy's application and the resulting isopleths are reported below (Tables 4 and 5).

Calculated distances to Level A harassment (PTS Onset) and Level B harassment thresholds are large, especially for DTH and rock hammering activities. However, the full distance of sound propagation would not be reached due to the presence of land masses and anthropogenic structures that would prevent the noise from reaching nearly the full extent of the larger harassment isopleths. The region of influence (ROI), which illustrates that the land masses preclude the sound from traveling more than approximately 870 m (3,000 ft) from the source, at most.

Maximum distances are provided for the behavioral thresholds for in-water construction activities. Areas encompassed within the threshold (harassment zones) were calculated by using a Geographical Information System to clip the maximum calculated distances to the extent of the ROI.

Table 4 summarizes the calculated maximum distances corresponding to the underwater marine mammal harassment zones from impulsive (impact pile driving, rock hammering, DTH) and Table 5 for non-impulsive noise (vibratory pile driving, rotary drilling, etc.) and the area of the harassment zone within the ROI. The distances do not take the land masses into consideration, but the ensonified areas do. Neither consider the

reduction that will be achieved by the required use of a bubble curtain for certain activities and therefore all take estimates are considered conservative. Refer to Figures 6-9 through 6-11 of the application for the calculated maximum distances corresponding to the underwater marine mammal harassment zones from impulsive (impact pile driving, rock hammering, DTH) and non-impulsive noise (vibratory pile driving, rotary drilling) and the corresponding area of the harassment zone within the ROI.

Table 5--Calculated Distance and Areas of Level A and Level B Harassment for Impulsive Noise (DTH, Impact Pile Driving, Hydraulic Rock Hammering)

Activity	Purpose	Count and Size/Duration	Total Production Days	Level A Harassment (PTS Onset)*		Level B Harassment*
				High Frequency Cetaceans (Harbor Porpoise)	Phocid Pinnipeds	Harbor Porpoise and Phocids
DTH Cluster Drill	Foundation Support Piles for Center Wall	38, 78-inch shafts	247	84,380.4 m/ 0.417 km ²	37,909.7 m/ 0.417 km ²	13,594 m/0.417 km ²
DTH Cluster Drill	Foundation Leveling Piles for Center Wall	18, 78-inch shafts	117	84,380.4 m/ 0.417 km ²	37,909.7 m/ 0.417 km ²	13,594 m/0.417 km ²
DTH Cluster Drill	Center Wall-Access Support Platform	38, 78-inch shafts	133	84,380.4 m/ 0.417 km ²	37,909.7 m/ 0.417 km ²	13,594 m/0.417 km ²
DTH Mono-hammer	Center Wall – Temporary Launching Piles	6, 42-inch shafts	6	3,880.3 m/ 0.417 km ²	1,743.3 m/ 0.417 km ²	13,594 m/0.417 km ²
DTH Mono-hammer	Center Wall Tie-Downs	36, 9-inch holes	18	244.8 m/ 0.074 km ²	110 m/ 0.0229 km ²	13,594 m/0.417 km ²
DTH Mono-hammer	Center Wall-Access Platform Tie-Downs	18, 9-inch holes	9	244.8 m/ 0.0741 km ²	110 m/ 0.0229 km ²	13,594 m/0.417 km ²

Impact Pile Driving	West Closure Wall Tie-In to Existing Wall	16**, 28-inch Z-shaped sheets	4**	988.2 m/ 0.4034 km ²	444.0 m/ 0.2012 km ²	2,512 m/0.417 km ²
Impact Pile Driving	Berth 11 End Wall Secant Pile Guide Wall	60, 28-inch Z-shaped sheets	7	1,568.6 m/ 0.417 km ²	704.7 m/0.365 km ²	2,512 m/0.417 km ²
DTH Mono-hammer	Relief Holes Under West Closure Cell	500, 4-6 inch holes	20	180.1 m/ 0.0481 km ²	80.9 m/ 0.015 km ²	13,594 m/ 0. 417km ²
DTH Mono-hammer	Mechanical Rock Removal Along Face of Existing Abutment	46, 42-inch casing advancement s	24	3,880.3 m/ 0.417 km ²	1,743.3 m/ 0.417 km ²	13,594 m/0.417 km ²
DTH Mono-hammer	Install Piles for Dry Dock 1 North Entrance Abutment	28, 42-inch shafts	28	3,880.3 m/ 0.417 km ²	1,743.3 m/ 0.417 km ²	13,594 m/0.417 km ²
DTH Mono-hammer	Relief Holes Under West Closure Cell	2,201**, 4-6 inch holes	82**	180.1 m/ 0.0481km ²	80.9 m/ 0.015 km ²	13,594 m/ 0.417 km ²
DTH Mono-hammer	Mechanical Rock Removal Along Face of Existing Abutment	365, 42-inch casing advancement s	183	3,880.3 m/ 0.417 km ²	1,743.3 m/ 0.417 km ²	13,594 m/ 0.417 km ²
DTH Mono-hammer	Dry Dock 1 Entrance Tremie Tie Downs	100, 9-inch holes	52	132.9 m/ 0.0303 km ²	59.7 m/ 0.009km ²	13,594 m/0.417 km ²
Impact Pile Driving	Install Sheet Piles for Dry Dock 1 North Entrance and Temporary Cofferdam	96, 28-inch Z-shaped sheets	12	1,568.6 m/ 0.417 km ²	704.7 m/ 0.365km ²	2,512 m/ 0.417 km ²

Hydraulic Rock Hammer	Removal of Sheetpile and Granite Quay Wall (610 cy)	2.5 hours	10**	5,860.0 m/ 0.417 km ²	2,633 m/ 0.4174km ²	398 m/ 0.165 km ²
Hydraulic Rock Hammer	Mechanical Rock Removal (985 cy) Under West Closure Cell	9 hours	77	13,766 m/ 0.417 km ²	6,184.7 m/ 0.417 km ²	398 m/ 0.165 km ²
Hydraulic Rock Hammer	Shutter Panel Demolition	5 hours	56**	9,303.1 m/ 0.417 km ²	4,179.6 m/ 0.417 km ²	398 m/ 0.165 km ²
Hydraulic Rock Hammer	Mechanical Rock Removal (3,500 cy) Along Face of Existing Berth 11 at Basin Floor	12 hours	100**	16,676.3 m/ 0.417 km ²	7,492.2 m/ 0.417 km ²	398 m/ 0.165 km ²
Hydraulic Rock Hammer	P-310 Sheet Pile Removal - Berth 1	12, 25-inch Z-shaped sheets, 6 hours	3**	10,505.4 m/ 0.417 km ²	4,719.8 m/ 0.417 km ²	398 m/ 0.1652 km ²
Hydraulic Rock Hammer	Berth 1 Top of Wall Demolition for Waler Install	10 hours	6**	14,767.7 m/ 0.417 km ²	6,634.7 m/ 0.417 km ²	398 m/ 0.165km ²

Source: Kiewit 2021.

Notes:

*To determine underwater harassment zones, ensonified areas from the source were clipped along the shoreline using Geographical Information Systems (GIS)

**These activities will continue into the following construction years and the remaining construction days and activities will be included in a subsequent LOA. The construction days and activities represented in this table account ONLY for year 1 activities

lf = linear feet; N/A = Not Applicable

Proxy sources used were unattenuated SPLs.

Table 5--Calculated Distance and Areas of Level A and Level B Harassment for

Non-Impulsive Noise (vibratory pile driving, rotary drilling)

Activity	Purpose	Count and Size	Total Production Days	Level A Harassment (PTS Onset)		Level B Harassment
				High Frequency Cetaceans Harbor Porpoise	Phocid Pinnipeds	Harbor Porpoise and Phocids

Rotary Drill	Center Wall Foundation Pile – Install Outer Casing	38, 102-inch Borings	38	2.1 m/ 0.000014 km ²	1.3 m/ 0.000005 km ²	1,848 m/ 0.417 km ²
Rotary Drill	Center Wall Foundation Pile –Pre-Drill Socket	38, 102-inch Borings	38	8.9 m/ 0.000248 km ²	5.4 m/ 0.000091 km ²	1,848 m/ 0.417 km ²
Rotary Drill	Center Wall Foundation Pile – Remove Outer Casing	38, 102-inch Borings	38	0.8 m/ 0.000002 km ²	0.5 m/ 0.000001 km ²	1,848 m/ 0.417 km ²
Rotary Drill	Center Wall Leveling Piles – Install Outer Casing	18, 102-inch Borings	18	2.1 m/ 0.000014 km ²	1.3 m/ 0.000005 km ²	1,848 m/ 0.417 km ²
Rotary Drill	Center Wall Leveling Piles –Pre-Drill Socket	18, 102-inch Borings	18	8.9 m/ 0.000248 km ²	5.4 m/ 0.000091 km ²	1,848 m/ 0.417 km ²
Rotary Drill	Center Wall Leveling Piles – Remove Outer Casing	18, 102-inch Borings	18	0.8 m/ 0.000002 km ²	0.5 m/ 0.000001 km ²	1,848 m/ 0.417 km ²
Rotary Drill	Center Wall Access Platform Support – Install Outer Casing	38, 102-inch Borings	38	2.1 m/ 0.000014 km ²	1.3 m/ 0.000005 km ²	1,848 m/ 0.417 km ²
Rotary Drill	Center Wall Access Platform Support – Pre-Drill Socket	38, 102-inch Borings	38	8.9 m/ 0.000248 km ²	5.4 m/ 0.000091 km ²	1,848 m/ 0.417 km ²

Rotary Drill	Center Wall Access Platform Support – Remove Outer Casing	38, 102-inch Borings	38	0.8 m/ 0.000002 km ²	0.5 m/ 0.000001 km ²	1,848 m/ 0.417 km ²
Vibratory Pile Driving	Tie-In to Existing West Closure Wall	16**, 28-inch Z-Shaped Sheets	4**	12.2 m/ 0.000454 km ²	5.0 m/0.000078 km ²	13,594 m/ 0.417 km ²
Vibratory Pile Driving	Berth 11 End Wall Secant Pile Guide Wall	60, 28-inch Z-Shaped Sheets	7	19.4 m/ 0.001041 km ²	8.0 m/0.0002 km ²	13,594 m/ 0.417 km ²
Vibratory Extraction	Remove P-310 West Closure Wall	238, 18-inch Flat Sheets	60	6.6 m/ 0.000136 km ²	2.7 m/0.000023 km ²	7,356 m/ 0.417 km ²
Vibratory Pile Driving	Install Sheet Piles for Dry Dock 1 North Entrance and Temporary Cofferdam	96, 28-inch Z-Shaped Sheets	12	19.4 m/ 0.001041 km ²	8.0 m/ 0.0002 km ²	13,594 m/ 0.417 km ²

**These activities will continue into the following construction years and the remaining construction days and activities will be included in a subsequent LOA. The construction days and activities represented in this table account ONLY for year 1 activities

lf = linear feet; N/A = Not Applicable

Proxy sources used were unattenuated SPLs.

Concurrent Activities

Simultaneous use of pile drivers, hammers, and drills could result in increased SPLs and harassment zone sizes given the proximity of the component sites and the rules of decibel addition (see Table 6 below). Due to the relatively small size of the ROI, the use of a single DTH cluster drill or rock hammer would ensound the entire ROI to the Level A harassment thresholds (PTS Onset) (refer to Table 4). Therefore, when this equipment is operated in conjunction with other noise generating equipment, there would be no change in the size of the harassment zone. The entire ROI would remain ensounded to the Level A harassment thresholds for the duration of the activity and there would be no Level B harassment zone. However, when DTH cluster drills or rock hammers are not

in use, increased SPLs and harassment zone sizes within the ROI could result. Due to the large amount of bedrock excavation required for the construction of the multifunctional expansion of Dry Dock 1, the only scenario identified in which DTH cluster drills and/or rock hammers would not be in operation would be at the beginning of the project when two rotary drills could be used simultaneously.

According to recent, project specific, guidance provided by NMFS to the Navy, when two noise sources have overlapping sound fields, there is potential for higher sound levels than for non-overlapping sources because the isopleth of one sound source encompasses the sound source of another isopleth. In such instances, the sources are considered additive and combined using the rules of decibel addition, presented in Table 6 below.

Table 6--Adjustments for Sound Exposure Level Criterion

Source Types	Difference in Sound Level (at specified meters)	Adjustments to Specifications for Level A Harassment RMS/SEL _{ss} * Calculations
Non-impulsive, continuous/Non-impulsive, continuous OR Impulsive source (multiple strikes per second)/Impulsive source (multiple strikes per second)	0 or 1 dB	Add 3 dB to the highest sound level (at specified meters) AND adjust number of piles per day to account for overlap (space and time)
	2 or 3 dB	Add 2 dB to the highest sound level (at specified meters) AND adjust number of piles per day to account for overlap (space and time)
	4 to 9 dB	Add 1 dB to the highest sound level (at specified meters) AND adjust number of piles per day to account for overlap (space and time)
	10 dB or more	Add 0 dB to the highest sound level (at specified meters) AND adjust number of piles per day to account for overlap (space and time)

* RMS level for vibratory pile driving/rotary hammer and single strike SEL (SEL_{ss}) level for DTH/rock

hammer

For simultaneous usage of three or more continuous sound sources, the three overlapping sources with the highest sound source levels are identified. Of the three highest sound source levels, the lower two are combined using the above rules, then the combination of the lower two is combined with the highest of the three. For example, with overlapping isopleths from 24-, 36-, and 42-inch diameter steel pipe piles with sound source levels of 161, 167, and 168 dB RMS respectively, the 24- and 36-inch would be added together; given that $167 - 161 = 6$ dB, then 1 dB is added to the highest of the two sound source levels (167 dB), for a combined noise level of 168 dB. Next, the newly calculated 168 dB is added to the 42-inch steel pile with sound source levels of 168 dB. Since $168 - 168 = 0$ dB, 3 dB is added to the highest value, or 171 dB in total for the combination of 24-, 36-, and 42-inch steel pipe piles (NMFS, 2021 unpublished). By using this method, a revised proxy source for Level A and Level B analysis was determined for the use of two, 102-inch diameter rotary drills. The revised proxy value is presented in Table 7 and the resulting harassment zones are summarized in Table 8 (depicted in Figure 6-13 in the Navy's application).

Table 7--Revised Proxy Values for Simultaneous Use of Non-impulsive Sources

Equipment		Rotary Drill
	RMS	154
Rotary Drill	154	157

Table 8--Level A and Level B Harassment Zones Resulting from the Simultaneous use of two, 102-in diameter rotary drill

Multiple Source Scenario	Level A Harassment (PTS Onset)		Level B Harassment
	Harbor Porpoise Distance to 155 dB SEL _{cum} Threshold/Area of Harassment Zone	Phocids Distance to 185 dB SEL _{cum} Threshold/Area of Harassment Zone	Harbor Porpoise and Phocids Distance to 120 dB (DTH) Threshold/Area of Harassment Zone
2 Rotary Drills	23.6 m/ 0.002 km ²	9.7 m/0.0002 km ²	2,929 m/0.417 km ²

Marine Mammal Occurrence and Take Calculation and Estimation

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations. Potential exposures to impact pile and vibratory pile driving, rotary drilling, DTH, and rock hammering noise for each acoustic threshold were estimated using marine mammal density estimates (N) from the Navy Marine Species Density Database (NMSDD) (Navy 2017) or from monitoring reports from the Berth 11 Waterfront Improvements and P-310 construction projects. Specifically, where monitoring data specific to the project area were available, they were used, and the NMSDD data were used when there were no monitoring data available. The take estimate was determined using the following equation $\text{take estimate} = N * \text{days of activity} * \text{area of harassment}$. The pile type, size, and installation method that produce the largest zone of influence (ZOI) were used to estimate exposure of marine mammals to noise impacts. We describe how the information provided above is brought together to produce a quantitative take estimate in the species sections below.

Harbor Porpoise

Harbor porpoises may be present in the proposed project area during spring, summer, and fall, from April to December. Based on density data from the Navy Marine Species Density Database, their presence is highest in spring, decreases in summer, and slightly increases in fall. During previous monitoring of construction projects in the area, three harbor porpoise were sighted between April and December of 2017; two harbor

porpoise were sighted in early August of 2018; and one harbor porpoise was sighted in 2020 (Cianbro 2018a, b; Navy 2019; NAVFAC 2021). Using the 2017 and 2018 data from construction monitoring for the Berth 11 Waterfront Improvements project, the density of harbor porpoise for the largest harassment zone was determined to be 0.04/km².

Estimated take was calculated by density * harassment zone * days for each activity (see Table 9). Note that where the Level A harassment zone is as large as the Level B harassment zone and fills the entire ensonified area, the enumerated takes in the Level A harassment column may be in the form of Level A harassment and/or Level B harassment.

Table 9--Calculated proposed take by Level A and Level B harassment of Harbor porpoise by project activity.

Project Activity	Density	Level A Harassment Zone (km ²)	Number of Days	Take by Level A Harassment	Level B Harassment Zone (km ²)	Take by Level B Harassment
Center Wall-Install Foundation: 38 drilled shafts: Cluster drill DTH (Drill) 78-inch diameter casing	0.04	0.417	247	4	0.417	0
Center Wall - Install Diving Board Shafts: 18 drilled shafts: Cluster drill DTH (Drill) 78-inch diameter socket	0.04	0.417	117	2	0.417	0
Center Wall - Access Platform Support: 38 drilled shafts: Cluster Drill DTH (Drill) 78-inch outer casing	0.04	0.417	133	2	0.417	0
Mechanical Rock Excavation, Hydraulic rock hammering (985 cy)	0.04	0.417	77	1	0.165	0
Remove Shutter Panels: 112 panels, Demolish shutter panels, Hydraulic rock hammering	0.04	0.417	56	1	0.165	0
Mechanical Rock Removal at Basin Floor: Excavate	0.04	0.417	100	2	0.165	0

Bedrock, Hydraulic rock hammering						
Mechanical Rock at Abutment: Drill 365 rock borings (1,220 cy), 42-inch diameter casing, Mono-hammer DTH	0.04	0.417	183	3	0.417	0
Center Wall-Install Foundation: 38 drilled shafts: Rotary Drill (Install) 102-inch diameter outer casing	0.04	0.00001	38	0	0.417	1
Center Wall-Install Foundation: 38 drilled shafts: Rotary Drill (Pre-drill) 102-inch diameter socket,	0.04	0.00001	38	0	0.417	1
Center Wall-Install Foundation: 38 drilled shafts: Rotary Drill (Remove) 102-inch outer casing	0.04	0.00001	38	0	0.417	1
Center Wall - Access Platform Support: 38 drilled shafts: Rotary Drill (Install) 102-inch diameter outer casing	0.04	0.00001	38	0	0.417	1
Center Wall - Access Platform Support: 38 drilled shafts: Rotary Drill (Pre-drill) 102-inch diameter socket	0.04	0.00001	38	0	0.417	1
Center Wall - Access Platform Support: 38 drilled shafts: Rotary Drill (Remove) 102-inch outer casing,	0.04	0.0000002	38	0	0.417	1
Remove Wall: 238 sheet piles, 18-inch wide flatwebbed, Vibratory Extraction	0.04	0.000136	60	0	0.417	1
Mechanical Rock Removal at Basin Floor: Drill 2,201 relief holes, 4-6 holes, Mono-hammer DTH,	0.04	0.048109	82	0	0.417	1
Drill Tremie Ties Downs: Drill 100 rock anchors, 9-inch holes, Mono-hammer DTH	0.04	0.0303	52	0	0.417	1
Total Estimated Take				15		9

In summary, we estimate that up to 15 takes in the form of Level A harassment and/or Level B harassment could occur during DTH excavation (DTH mono-hammer and cluster drill), impact pile driving, and rock hammering activities. In addition, DTH mono-hammer excavation could result in 2 takes by Level B harassment and vibratory installing/extracting and rotary drilling activities could result in 7 takes by Level B harassment (Table 9).

Harbor Seal

Harbor seals may be present year-round in the project vicinity, with constant densities throughout the year. Harbor seals are the most common pinniped in the Piscataqua River near the Shipyard. Harbor seal sightings were recorded during monthly surveys conducted in 2017 and 2018 (NAVFAC Mid-Atlantic 2018, 2019b) as well as during Berth 11 and P-310 construction monitoring in 2017, 2018, 2020 and 2021 (Cianbro 2018a, b; Navy 2019; Stantec 2020, Stantec 2021). Estimated take by Level B harassment has been calculated by multiplying the average number of harbor seals sighted per day from May 2020 through October 2021 by the number of actual in-water construction days (375 days (159 during P-310 year 1 and 216 during P-310 year 2). Over the course of this time period, there have been 1,023 harbor seal observations equating to equating to 3 harbor seal sightings per day. Initially, takes were calculated for Level A and Level B harassment for harbor seals where the density of animals (2.48 harbor seals/km², rounded to 3) was multiplied by the harassment zone and the number of days per construction activity. However, using that method produced take numbers for Level B harassment that were lower than the number of harbor seals that has been previously observed in the Navy's monitoring reports. Therefore, NMFS is proposing (and the Navy agrees), to increase the take by Level B harassment to more accurately reflect harbor seal observations in the monitoring reports, by using the value of three harbor seals a day multiplied by the total number of construction days resulting in 1,125 takes by Level B

harassment proposed for authorization. Take by Level A harassment of 1,269 harbor seals is shown in Table 10 below. Note that where the Level A harassment zone is as large as the Level B harassment zone and fills the entire ensonified area, the enumerated takes in the Level A harassment column may be in the form of Level A harassment and/or Level B harassment. The authorized takes by Level B harassment were not included in Table 10 as they were calculated by a different method discussed above

Table 10--Calculated proposed take by Level A harassment of Harbor seal by project activity

Project Activity	Harbor Seals Density	Level A Harassment Zone (km ²)	Number of Days	Take by Level A Harassment
Center Wall-Install Foundation: 38 drilled shafts: Cluster drill DTH (Drill) 78-inch diameter casing	3	0.417	247	309
Center Wall - Install Diving Board Shafts: 18 drilled shafts: Cluster drill DTH (Drill) 78-inch diameter socket	3	0.417	117	146
Center Wall - Access Platform Support: 38 drilled shafts: Cluster Drill DTH (Drill) 78-inch outer casing	3	0.417	133	166
Center Wall - Temp Launching Piles: 6 drilled shafts: 42-inch diameter shaft, Mono-hammer DTH	3	0.417	6	8
Center Wall Tie Downs: 36 Rock Anchors (Install): 9-inch diameter holes, Mono-hammer DTH	3	0.023	18	1
Center Wall - Access Platform Tie Downs: 18 Rock Anchors (Install): 9-inch diameter holes, Mono-hammer DTH	3	0.023	9	1
Center Wall-Install Tie-In to Existing West Closure Wall: 16 sheet piles: 28-inch wide Z-shaped sheets - IMPACT Install	3	0.201	4	2
Berth 11 End Wall - Install Secant Pile Guide Wall: 60 sheets piles: 28-inch wide Z-shaped sheets - IMPACT Install	3	0.417	7	8
Berth 1 - Remove Granite Block Quay Wall: 610 cy, Granite block demo, Hydraulic Rock hammering	3	0.417	10	13
P310 West Closure Wall - Mechanical Rock Excavation:	3	0.417	77	96

985 cy, Excavated bedrock, Hydraulic rock hammering				
P310 West Closure Wall - Mechanical Rock Excavation: Drill 500 relief holes, 4-6 inch holes, Mono-hammer DTH	3	0.015	20	1
P310 West Closure Wall - Mechanical Rock Excavation: Drill 46 rock borings (50 cy), 42-inch diameter casing, Mono-hammer DTH	3	0.417	24	30
West Closure well - Berth 11 Abutment- Install Piles: Drill 28 shafts, 42-inch diameter casing, Mono-hammer DTH	3	0.417	28	35
Berth 11 - Remove Shutter Panels: 112 panels, Demolish shutter panels, Hydraulic rock hammering	3	0.417	56	70
Berth 11 Face - Mechanical Rock Removal at Basin Floor: 3,500 cy, Excavate Bedrock, Hydraulic rock hammering	3	0.417	100	125
Berth 11 Face - Mechanical Rock Removal at Basin Floor: Drill 2,201 relief holes, 4-6 holes, Mono-hammer DTH	3	0.015	82	4
Berth 11 Face - Mechanical Rock at Abutment: Drill 365 rock borings (1,220 cy), 42-inch diameter casing, Mono-hammer DTH	3	0.417	183	229
Dry Dock 1 North Entrances - Install Temporary Cofferdam: Install 96 sheet piles, 28-inch wide Z-shaped sheets, IMPACT Install	3	0.365	12	13
Berth 1 -Remove sheet piles: Remove 12 sheet piles, 25-inch wide Z-shaped sheets, Hydraulic rock hammering	3	0.417	3	4
Berth 1 Top of Wall - Demolition for Waler Installation: 30 lf, Mechanical concrete demolition, Hydraulic rock hammering	3	0.417	6	8
Total Estimated Take				1,269

Gray Seal

Gray seals may be present year-round in the project vicinity, with constant densities throughout the year. Gray seals are less common in the Piscataqua River than the harbor seal. Sightings of gray seals were recorded during P-310 construction

monitoring in 2020 and 2021 (Stantec 2020; Stantec 2021). Estimated take by Level B harassment has been calculated by multiplying the average number of gray seal observations per day from May 2020 through October 2021 (47 during year 1 P-310 monitoring and 9 during year 2 P-310 monitoring (to date)) over the course of 337 monitoring days (Stantec 2020; 2021). Over the course of this time period, there have been 56 gray seal observations equating to equating to 0.2 gray seal sightings per day. Initially, takes were calculated for Level A and Level B harassment for gray seals where the density was multiplied by the harassment zone and the number of days per construction activity. However, using that method produced take numbers for Level B harassment that were fewer than the number of gray seals that has been previously observed in the Navy's monitoring reports. Therefore, NMFS (and the Navy agreed) increased the take by Level B harassment to more accurately reflect gray seal observations in the monitoring reports, by using the value of 0.2 gray seals multiplied by the total number of construction days resulting in 75 takes by Level B harassment. Take by Level A harassment of 85 gray seals is shown in Table 11 below. Note that where the Level A harassment zone is as large as the Level B harassment zone and fills the entire ensonified area, the enumerated takes in the Level A harassment column may be in the form of Level A harassment and/or Level B harassment. The authorized takes by Level B harassment were not included in Table 11 as they were calculated by a different method as discussed above.

Table 11--Calculated proposed take by Level A harassment of Gray Seal by project activity

Project Activity	Gray Seal Density	Level A Harassment Zone (km ²)	Number of Days	Take by Level A Harassment
Center Wall-Install Foundation: 38 drilled shafts: Cluster drill DTH (Drill) 78-inch diameter casing	0.2	0.417	247	21
Center Wall - Install Diving Board Shafts: 18 drilled shafts: Cluster drill DTH (Drill) 78-inch diameter socket	0.2	0.417	117	10

Center Wall - Access Platform Support: 38 drilled shafts: Cluster Drill DTH (Drill) 78-inch outer casing	0.2	0.417	133	11
Center Wall - Temp Launching Piles: 6 drilled shafts: 42-inch diameter shaft, Mono-hammer DTH	0.2	0.417	6	1
Berth 11 End Wall - Install Secant Pile Guide Wall: 60 sheets piles: 28-inch wide Z-shaped sheets - IMPACT Install	0.2	0.417	7	1
Berth 1 - Remove Granite Block Quay Wall: 610 cy, Granite block demo, Hydraulic Rock hammering	0.2	0.417	10	1
P310 West Closure Wall - Mechanical Rock Excavation: 985 cy, Excavated bedrock, Hydraulic rock hammering	0.2	0.417	77	6
P310 West Closure Wall - Mechanical Rock Excavation: Drill 19 rock borings (50 cy), 42-inch diameter casing, Mono-hammer DTH	0.2	0.417	24	2
West Closure well - Berth 11 Abutment- Install Piles: Drill 28 shafts, 42-inch diameter casing, Mono-hammer DTH	0.2	0.417	28	2
Berth 11 - Remove Shutter Panels: 112 panels, Demolish shutter panels, Hydraulic rock hammering	0.2	0.417	56	5
Berth 11 Face - Mechanical Rock Removal at Basin Floor: 1,020 cy, Excavate Bedrock, Hydraulic rock hammering	0.2	0.417	3	8
Berth 11 Face - Mechanical Rock at Abutment: Drill 192 rock borings (610 cy), 42-inch diameter casing, Mono-hammer DTH	0.2	0.417	24	15
Dry Dock 1 North Entrances - Install Temporary Cofferdam: Install 96 sheet piles, 28-inch wide Z-shaped sheets, IMPACT Install	0.2	0.365	12	1
Berth 1 Top of Wall - Demolition for Waler Installation: 30 lf, Mechanical concrete demolition, Hydraulic rock hammering	0.2	0.417	6	1
Total Estimated Take				85

Hooded Seal

Hooded seals may be present in the project vicinity from January through May, though their exact seasonal densities are unknown. In general, hooded seals are much rarer than the harbor seal and gray seal in the Piscataqua River. One take per month from January to May from Level B harassment of a hooded seal for the Berth 11 Waterfront Improvements Construction project (NMFS 2018b) and for Year 1 construction activities for Dry Dock 1 (NMFS, 2019) was previously authorized. To date, the monitoring for that project and for the density surveys have not recorded a sighting of hooded seal in the project area (Cianbro 2018a, b; NAVFAC Mid-Atlantic 2018, 2019b; Navy 2019; Stantec

2020; Stantec 2021). In order to guard against unauthorized take, the Navy requested and NMFS is authorizing one take by Level B harassment of hooded seal per month (between the months of January and May) resulting in five total takes of Level B harassment. No take by Level A harassment is anticipated or authorized.

Harp Seal

Harp seals may be present in the project vicinity January through May. In general, harp seals are much rarer than the harbor seal and gray seal in the Piscataqua River. As discussed above for hooded seals, one take by Level B harassment during each month of construction for the Berth 11 Waterfront Improvements Project (NMFS 2018b) and for year 1 construction activities for Dry Dock 1 (NMFS, 2019) was previously authorized. The monitoring for the Berth 11 Waterfront Improvements Construction and P-310 projects did not record any sightings of harp seal in the project area (Cianbro 2018a, b; NAVFAC Mid-Atlantic 2018, 2019b; Navy 2019; Stantec 2020; Stantec 2021). However, it should be noted that two harp seals (one on 5/12/2020 and one on 5/14/2020) were observed when pile driving activities were not occurring (Stantec 2020). In order to guard against unauthorized take, the Navy requested and NMFS is authorizing one take by Level B harassment of harp seal per month (between the months of January and May) resulting in five total takes of Level B harassment. No take by Level A harassment is anticipated or authorized.

Table 12 below summarizes the authorized take for all the species described above as a percentage of stock abundance.

Table 12—Proposed Take Estimates as a Percentage of Stock Abundance

Species	Stock(N_{EST})	Proposed Level A Harassment	Proposed Level B harassment	Percent of Stock
Harbor porpoise	Gulf of Maine/Bay of Fundy (95,543)	15	9	Less than 1 percent
Harbor seal	Western North	1,269	1,125	Less than 3

	Atlantic (61,336)			percent
Gray seal	Western North Atlantic (451,600)	85	75	Less than 1 percent
Hooded seal	Western North Atlantic (593,500)	0	5	Less than 1 percent
Harp seal	Western North Atlantic (7.6 million)	0	5	Less than 1 percent

Mitigation

Under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting the activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, we carefully consider two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned), and;

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, NMFS has determined that the mitigation measures provide the means effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

General

The Navy will follow mitigation procedures as described below. In general, if poor environmental conditions restrict full visibility of the shutdown zone, pile driving activities would be delayed.

Training

The Navy will ensure that construction supervisors and crews, the monitoring team, and relevant Navy staff are trained and prior to the start of construction activity, so that responsibilities, communication procedures, monitoring protocols, and operational procedures are clearly understood. New personnel joining during the project shall be trained prior to commencing work.

Avoiding Direct Physical Interaction

The Navy will avoid direct physical interaction with marine mammals during construction activity. If a marine mammal comes within 10 m of such activity, operations will cease and vessels will reduce speed to the minimum level required to maintain steerage and safe working conditions, as necessary to avoid direct physical interaction.

Shutdown Zones

The Navy will establish shutdown zones for all pile driving activities. The purpose of a shutdown zone is generally to define an area within which shutdown of the activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). Shutdown zones will vary based on the activity type and marine mammal hearing group (Table 13).

Table 13--Pile Driving Shutdown Zone and Monitoring Zones during Project Activities

P-381 Year 1 Activity Description	Shutdown Zone (m)		Level B Harassment ¹ Monitoring Zone (m)
	Harbor Porpoise	Phocids	
78-inch cluster drill	200 ²	50 ²	ROI
DTH monohammer- 42-inch	200 ²	50 ²	ROI
DTH monohammer – 9-inch Center wall tie downs	200 ²	50 ²	ROI
DTH monohammer – 9-inch tremie tie-downs	200 ²	50 ²	ROI
DTH monohammer – 4-6-inch (500)	200 ²	50 ²	ROI
Impact install of sheet piles (16) West Closure Wall Tie-in	200 ²	50 ²	ROI
Impact install of sheet piles (60) Secant pile guide wall; (96) temporary coffer dam	200 ²	50 ²	ROI
Rock hammering – all durations	200 ²	50 ²	ROI
Rotary drilling – Install 102-inch casing	10	10	ROI
Rotary drilling –Predrill 102-inch socket	10	10	ROI
Rotary drilling – Remove 102-inch casing	10	10	ROI
Vibratory pile driving (16) 28-inch sheets	20	10	ROI
Vibratory pile driving (60) and (96) 28-inch sheets	20	10	ROI
Vibratory extraction (238) 28-inch sheets	10	10	ROI

Notes:

¹ In instances where the harassment zone is larger than the ROI, the entire ROI is indicated as the limit of monitoring.

²Reduced Monitoring area distance negotiated with NMFS

Key: ROI – region of influence

Soft Start

The Navy will use soft start techniques when impact pile driving. Soft start requires contractors to provide an initial set of three strikes from the hammer at reduced energy, followed by a 30-second waiting period. Then two subsequent reduced-energy strike sets would occur. A soft start will be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of 30 minutes or longer. Soft start is not required during vibratory pile driving activities.

Bubble Curtain

A bubble curtain will be installed across any openings at the entrance of super flood basin to attenuate sound for the sound sources that encompass the entire ROI, which include during DTH excavation (DTH mono-hammer and cluster drill), hydraulic rock hammering and impact pile driving of sheet piles. The Navy will record hydroacoustic measurements inside and outside of the bubble curtain. Should the results of the recordings inside the bubble curtain show that thresholds are not being exceeded by the activity occurring, that upon review of the data by NMFS, Navy may discontinue use of the bubble curtain for those activities that are not actually exceeding thresholds.

Based on our evaluation of the applicant's planned measures, NMFS has determined that the mitigation measures provide the means of effecting the least practicable adverse impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an IHA for an activity, Section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the action area. Effective reporting is critical both to compliance as well as for ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density);

- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and
- Mitigation and monitoring effectiveness.

The Navy will submit a Marine Mammal Monitoring Plan to NMFS for approval in advance of the start of construction.

Monitoring Zones

The Navy will conduct monitoring to include the area within the Level B harassment zones (areas where SPLs are equal to or exceed the 160 dB RMS threshold for impact driving and the 120 dB RMS threshold during vibratory pile driving) (see Table 13 above). These monitoring zones provide utility for monitoring conducted for mitigation purposes (*i.e.*, shutdown zone monitoring) by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring of the disturbance zones enables observers to be aware of and communicate the presence of marine mammals in the project area, but outside the shutdown zone, and thus prepare for potential shutdowns of activity.

Visual Monitoring

Monitoring will take place from 30 minutes (min) prior to initiation of pile driving activity (*i.e.*, pre-start clearance monitoring) through 30 min post-completion of pile driving activity. If a marine mammal is observed entering or within the shutdown zones, pile driving will be delayed or halted. If pile driving is delayed or halted due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily exited and been visually confirmed beyond the shutdown zone or 15 min have passed without re-detection of the animal. Pile driving activity will be halted upon observation of either a species for which incidental take is not authorized or a species for which incidental take has been authorized but the authorized number of takes has been met, entering or within the disturbance zone.

Protected Species Observer (PSO) Monitoring Requirements and Locations

PSOs will be responsible for monitoring, the shutdown zones, the disturbance zones and the pre-clearance zones, as well as effectively documenting Level A and B harassment take. As described in more detail in the Reporting section below, they will also (1) document the frequency at which marine mammals are present in the project area, (2) document behavior and group composition, (3) record all construction activities, and (4) document observed reactions (changes in behavior or movement) of marine mammals during each sighting. The PSOs will monitor for marine mammals during all in-water pile activities associated with the project. The Navy shall monitor the project area to the extent possible based on the required number of PSOs, required monitoring locations, and environmental conditions. Visual monitoring shall be conducted by three PSOs. It is assumed that three PSOs shall be located on boats, docks, or piers sufficient to monitor the respective ROIs given the abundance of suitable vantage points (see Figure 11-1 of the application). The PSOs must record all observations of marine mammals, regardless of distance from the pile being driven.

Monitoring of pile driving will be conducted by qualified, PSOs. The Navy shall adhere to the following conditions when selecting PSOs:

- PSOs must be independent (*i.e.*, not construction personnel) and have no other assigned tasks during monitoring periods;
- At least one PSO must have prior experience performing the duties of a PSO during construction activities pursuant to a NMFS-issued incidental take authorization;
- Other PSOs may substitute other relevant experience, education (degree in biological science or related field), or training;
- Where a team of three PSOs are required, a lead observer or monitoring coordinator shall be designated. The lead observer must have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization; and

The Navy will ensure that the PSOs have the following additional qualifications:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;
- Experience and ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for

implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior; and

- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

Hydroacoustic Monitoring

The Navy will conduct a sound source verification (SSV) study for all pile types and will follow accepted methodological standards to achieve their objectives. The Navy will submit an acoustic monitoring plan to NMFS for approval prior to the start of construction. The Navy will collect and evaluate acoustic sound record levels for 10 percent of the new rotary drilling, DTH excavation (DTH mono-hammer and cluster drill), and rock hammering activities conducted as part of P-381 (Table 14). Hydrophones will be placed at locations 10 m (33 ft) from the noise source and, where the potential for Level A harassment exists, at a second representative monitoring location at an intermediate distance between the cetacean and phocid shutdown zones. For the 10 percent of rotary drilling, DTH excavation (DTH mono-hammer and cluster drill), and rock hammering events acoustically measured, 100 percent of the data will be analyzed.

At a minimum, the methodology includes:

- For underwater recordings, a stationary hydrophone system with the ability to measure SPLs will be placed in accordance with NMFS most recent guidance for the collection of source levels,
- Hydroacoustic monitoring will be conducted for 10 percent of each different type of activity not previously monitored as part of P-310 (Table 14). Monitoring will occur from the same locations approved by NMFS for P-310 construction activities. The resulting data set will be analyzed to examine and confirm sound pressure levels and rates of transmission loss for each separate in-water

construction activity. With NMFS concurrence, these metrics will be used to recalculate the limits of shutdown and Level B harassment zones, and to make corresponding adjustments in marine mammal monitoring of these zones for use in the forthcoming rulemaking/LOA application. Hydrophones will be placed in the same manner as for P-310 construction activities. Locations of hydroacoustic recordings will be collected via GPS. A depth sounder and/or weighted tape measure will be used to determine the depth of the water. The hydrophone will be attached to a-weighted nylon cord to maintain a constant depth and distance from the pile/drill/hammer location. The nylon cord or chain will be attached to a float or tied to a static line,

- Each hydrophone (underwater) will be calibrated at the start of each action and will be checked frequently to the applicable standards of the hydrophone manufacturer,
- For each monitored location, a single hydrophone will be suspended midway in the water column in order to evaluate site-specific attenuation and propagation characteristics that may be present throughout the water column,
- Environmental data will be collected, including but not limited to, the following: wind speed and direction, air temperature, humidity, surface water temperature, water depth, wave height, weather conditions, and other factors that could contribute to influencing the airborne and underwater sound levels (*e.g.*, aircraft, boats, etc.),
- The chief inspector will supply the acoustics specialist with the substrate composition, hammer/drill model and size, hammer/drill energy settings, depth of drilling, and boring rates and any changes to those settings during the monitoring;

- For acoustically monitored construction activities, data from the continuous monitoring locations will be post-processed to obtain the following sound measures:
 - Maximum peak pressure level recorded for all activities, expressed in dB re 1 μ Pa. This maximum value will originate from the phase of drilling/hammering during which drill/hammer energy was also at maximum (referred to as Level 4),
 - From all activities occurring during the Level 4 phase these additional measures will be made, as appropriate:
 - mean, median, minimum, and maximum RMS pressure level in (dB re 1 μ Pa),
 - mean duration of a pile strike (based on the 90 percent energy criterion),
 - number of hammer strikes, and;
 - mean, median, minimum, and maximum single strike SEL (dB re μ Pa² sec).
 - Cumulative SEL as defined by the mean single strike SEL + 10*log (number of hammer strikes) (dB re μ Pa² sec),
 - Median integration time used to calculate SPL RMS,
 - A frequency spectrum (pressure spectral density) (dB re μ Pa² per Hz) based on the average of up to eight successive strikes with similar sound. Spectral resolution will be 1 Hz, and the spectrum will cover nominal range from 7 Hz to 20 kHz, and;
 - Finally, the cumulative SEL will be computed from all the strikes associated with each pile occurring during all phases, *i.e.*, soft start, Level 1 to Level 4. This measure is defined as the sum of all single strike SEL

values. The sum is taken of the antilog, with \log_{10} taken of result to express (dB re $\mu\text{Pa}^2 \text{ sec}$).

Table 14—Hydroacoustic Monitoring Summary

Size	Count	Activity	Number Monitored
102-inch	94	Rotary Drill	9
78-inch	94	DTH Cluster Drill	9
42-inch	445	DTH Mono-hammer	10
9-inch	154	DTH Mono-hammer	10
4 to 6-inch	2,701	DTH Mono-hammer	10
NA	252 days	Rock Hammering	10

Marine Mammal Monitoring Reporting

The Navy will submit a draft report to NMFS within 90 calendar days of the completion of monitoring or 60 calendar days prior to the requested issuance of any subsequent IHA for construction activity at the same location, whichever comes first. The report will detail the monitoring protocol and summarize the data recorded during monitoring. The final report must be prepared and submitted within 30 days following resolution of any NMFS comments on the draft report. If no comments are received from NMFS within 30 days of receipt of the draft report, the report will be considered final. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments. All draft and final marine mammal monitoring reports must be submitted to *PR.ITP.MonitoringReports@noaa.gov* and *ITP.Egger@noaa.gov*. The report must contain the following informational elements, at minimum, (and be included in the Marine Mammal Monitoring Plan), including:

- Dates and times (begin and end) of all marine mammal monitoring;
- Construction activities occurring during each daily observation period, including:

- How many and what type of piles were driven and by what method (*e.g.*, impact or vibratory); and
- Total duration of driving time for each pile (vibratory driving) and number of strikes for each pile (impact driving);
- PSO locations during marine mammal monitoring;
- Environmental conditions during monitoring periods (at beginning and end of PSO shift and whenever conditions change significantly), including Beaufort sea state and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon, and estimated observable distance;
- Upon observation of a marine mammal, the following information:
 - PSO who sighted the animal and PSO location and activity at time of sighting;
 - Time of sighting;
 - Identification of the animal (*e.g.*, genus/species, lowest possible taxonomic level, or unidentified), PSO confidence in identification, and the composition of the group if there is a mix of species;
 - Distance and bearing of each marine mammal observed to the pile being driven for each sighting (if pile driving was occurring at time of sighting);
 - Estimated number of animals (minimum/maximum/best);
 - Estimated number of animals by cohort (adults, juveniles, neonates, group composition, etc.);
 - Animal's closest point of approach and estimated time spent within the harassment zone; and
 - Description of any marine mammal behavioral observations (*e.g.*, observed behaviors such as feeding or traveling), including an assessment of behavioral responses to the activity (*e.g.*, no response or changes in

behavioral state such as ceasing feeding, changing direction, flushing, or breaching);

- Detailed information about implementation of any mitigation (e.g., shutdowns and delays), a description of specific actions that ensued, and resulting changes in behavior of the animal, if any; and
- All PSO datasheets and/or raw sightings data.

Reporting of Hydroacoustic Monitoring

The Navy will also submit a draft hydroacoustic monitoring report to NMFS within 60 workdays of the completion of required monitoring at the end of the project. The report will detail the hydroacoustic monitoring protocol and summarize the data recorded during monitoring. The final report must be prepared and submitted within 30 days following resolution of any NMFS comments on the draft report. If no comments are received from NMFS within 30 days of receipt of the draft report, the report shall be considered final. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments. All draft and final hydroacoustic monitoring reports must be submitted to

PR.ITP.MonitoringReports@noaa.gov and *ITP.Egger@noaa.gov*. The hydroacoustic monitoring report will contain the informational elements described in the Hydroacoustic Monitoring Plan and, at minimum, will include:

- Hydrophone equipment and methods: recording device, sampling rate, distance (m) from the pile where recordings were made; depth of water and recording device(s);
- Type and size of pile being driven, substrate type, method of driving during recordings (e.g., hammer model and energy), and total pile driving duration;
- Whether a sound attenuation device is used and, if so, a detailed description of the device used and the duration of its use per pile;

- For impact pile driving and/or DTH excavation (DTH mono-hammer and cluster drill) (per pile): Number of strikes and strike rate; depth of substrate to penetrate; pulse duration and mean, median, and maximum sound levels (dB re: 1 μ Pa): root mean square sound pressure level (SPLrms); cumulative sound exposure level (SELcum), peak sound pressure level (SPLpeak), and single-strike sound exposure level (SELs-s);
- For vibratory driving/removal and/or DTH excavation (DTH mono-hammer and cluster drill) (per pile): Duration of driving per pile; mean, median, and maximum sound levels (dB re: 1 μ Pa): root mean square sound pressure level (SPLrms), cumulative sound exposure level (SELcum) (and timeframe over which the sound is averaged); and
- One-third octave band spectrum and power spectral density plot.
- General Daily Site Conditions
 - Date and time of activities,
 - Water conditions (*e.g.*, sea state, tidal state); and
 - Weather conditions (*e.g.*, percent cover, visibility).

Reporting of Injured or Dead Marine Mammals

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, the Navy will report the incident to NMFS Office of Protected Resources (OPR) (*PR.ITP.MonitoringReports@noaa.gov*), NMFS (301-427-8401) and to the Greater Atlantic Region New England/Mid-Atlantic Stranding Coordinator (866-755-6622) as soon as feasible. If the death or injury was clearly caused by the specified activity, the Navy must immediately cease the specified activities until NMFS OPR is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of this rule.

The Navy will not resume their activities until notified by NMFS. The report must include the following information:

- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
- Species identification (if known) or description of the animal(s) involved;
- Condition of the animal(s) (including carcass condition if the animal is dead);
- Observed behaviors of the animal(s), if alive;
- If available, photographs or video footage of the animal(s); and
- General circumstances under which the animal was discovered.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be taken through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS' implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as

reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, this introductory discussion of our analyses applies to all of the species listed in Table 1, given that many of the anticipated effects of this project on different marine mammal stocks are expected to be relatively similar in nature. Where there are meaningful differences between species or stocks in anticipated individual responses to activities, impacts of expected take on the population due to differences in population status, or impacts on habitat, they are described independently in the analysis below.

Construction activities associated with the project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level A and Level B harassment from underwater sounds generated by pile driving activities, rotary drilling, rock hammering, and DTH. Potential takes could occur if marine mammals are present in zones ensounded above the thresholds for Level A and Level B harassment, identified above, while activities are underway.

No serious injury or mortality would be expected even in the absence of the proposed mitigation measures. A bubble curtain will be installed across any openings at the entrance of super flood basin to attenuate sound for the sound sources that encompass the entire ROI include during DTH excavation (DTH mono-hammer and cluster drill), rock hammering, and impact pile driving of sheet piles. During all impact driving, implementation of soft start procedures and monitoring of established shutdown zones will be required, significantly reducing the possibility of injury. Given sufficient notice through use of soft start (for impact driving), marine mammals are expected to move away from an irritating sound source prior to it becoming potentially injurious. In addition, PSOs will be stationed within the action area whenever pile driving, rotary

drilling, rock hammering and DTH activities are underway. The Navy shall employ the use of three PSOs to ensure all monitoring and shutdown zones are properly observed. For hooded and harp seals which are a rare species in within the project area, we do not anticipate any take by Level A harassment.

The Navy's planned activities and associated impacts will occur within a limited area. Most of the work will occur behind the existing super flood basin walls that would act as a barrier to sound and would contain underwater noise to within a small portion of the Piscataqua River. Exposures to elevated sound levels produced during pile driving activities may cause behavioral disturbance of some individuals, but they are expected to be mild and temporary and further minimized by the use of a bubble curtain and soft starts. As described previously, the mitigation and monitoring measures are expected to further reduce the likelihood of injury as well as reduce behavioral disturbances.

Effects on individuals that are taken by Level B harassment, as enumerated in the **Estimated Take** section, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.*, Thorson and Reyff 2006). Most likely, individual animals will simply move away from the sound source and be temporarily displaced from the area, although even this reaction has been observed primarily only in association with impact pile driving. The activities analyzed here are similar to numerous other construction activities conducted along both Atlantic and Pacific coasts, which have taken place with no known long-term adverse consequences from behavioral harassment. These reactions and behavioral changes are expected to subside quickly when the exposures cease. Level B harassment will be minimized through use of mitigation measures described herein. including the soft starts and the use of the bubble curtain, which was not quantitatively factored into the take estimates.

Regarding Level A harassment particularly for harbor seals and gray seals, monitoring and shutdown protocols, and a bubble curtain implemented during DTH excavation (DTH mono-hammer and cluster drill), hydraulic rock hammering, and impact pile driving of sheet piles would minimize potential for take by Level A harassment. For pinnipeds, the calculated Level A harassment likely overestimates PTS exposure because: (1) seals are unlikely to remain in the Level A harassment zone underwater long enough to accumulate sufficient exposure to noise resulting in PTS, and (2) the estimate assumes that new seals are in the Level A harassment zone every day during pile driving. Further as discussed above, take by Level A harassment would be minimized due to implementation of monitoring, shutdown procedures and a bubble curtain. Nonetheless, we have considered the potential impacts of these PTS takes occurring in this analysis. The degree of PTS that may incur from the Navy's activities are not expected to impact marine mammals such that their reproduction or survival could be affected. Similarly, data do not suggest that a single instance in which an animal accrues PTS (or TTS) and is subject to behavioral disturbance would result in impacts to reproduction or survival. If PTS were to occur, it would be at a lower level likely to accrue to a relatively small portion of the population by being a stationary activity in one particular location.

The project is also not expected to have significant adverse effects on any marine mammal habitat. The project activities will not modify existing marine mammal habitat since the project will occur within the same footprint as existing marine infrastructure. Impacts to the immediate substrate are anticipated, but these would be limited to minor, temporary suspension of sediments, which could impact water quality and visibility for a short amount of time but which would not be expected to have any effects on individual marine mammals. The nearshore and intertidal habitat where the project will occur is an area of consistent vessel traffic from Navy and non-Navy vessels, and some local

individuals would likely be somewhat habituated to the level of activity in the area, further reducing the likelihood of more severe impacts. The closest pinniped haulout used by harbor and gray seals is 2,414 m (1.5 mi) away on the opposite side of the island and not within the ensonified area. There are no other biologically important areas for marine mammals near the project area.

In addition, impacts to marine mammal prey species are expected to be minor and temporary. Overall, the area impacted by the project is very small compared to the available surrounding habitat. The most likely impact to prey will be temporary behavioral avoidance of the immediate area. During construction activities, it is expected that some fish and marine mammals would temporarily leave the area of disturbance, thus impacting marine mammals' foraging opportunities in a limited portion of the foraging range. But, because of the relatively small area of the habitat that may be affected, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

In summary and as described above, the following factors primarily support our determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No mortality is anticipated or proposed for authorization;
- No Level A harassment is anticipated or proposed for authorization for hooded seals and harp seals;
- Level A harassment proposed for authorization for harbor and gray seals will be minimized with a bubble curtain and shutdown zones and is expected to be of a lower degree that would not impact the fitness of any animals;
- Anticipated incidents of Level B harassment consist of, at worst, temporary modifications in behavior;

- The required mitigation measures (*i.e.*, bubble curtain, shutdown zones) are expected to be effective in reducing the effects of the specified activity;
- Minimal impacts to marine mammal habitat/prey are expected;
- The action area is located within an active marine shipyard area,
- There is one pinniped haulouts in the vicinity of the project area, but it is on the opposite side of Seavey Island and not within the ensonified area; and
- There are no known biologically important areas in the vicinity of the project. Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat and, taking into consideration the implementation of the monitoring and mitigation measures, NMFS finds that the total marine mammal take from the proposed activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under sections 101(a)(5)(A) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers, so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. When the predicted number of individuals to be taken is fewer than one third of the species or stock abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

Take of five of the marine mammal stocks proposed for authorization will comprise at most approximately 3 percent or less of the stock abundance (Table 12). The number of animals proposed for authorization to be taken from these stocks would be

considered small relative to the relevant stock's abundances even if each estimated take occurred to a new individual, which is an unlikely scenario. Based on the analysis contained herein of the planned activity (including the mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our proposed action (*i.e.*, the issuance of an IHA) with respect to potential impacts on the human environment. This action is consistent with categories of activities identified in Categorical Exclusion B4 (IHAs with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has determined that the issuance of the IHA qualifies to be categorically excluded from further NEPA review.

Endangered Species Act (ESA)

No incidental take of ESA-listed species is proposed for authorization or expected to result from this activity. Therefore, NMFS has determined that formal consultation under section 7 of the ESA is not required for this action.

Authorization

NMFS has issued an IHA to the Navy for the taking of marine mammals incidental to modification and expansion of the Portsmouth Naval Shipyard Dry Dock 1 in Kittery, Maine, effective for one year from the date of issuance, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated

Dated: April 1, 2022.

Kimberly Damon-Randall,
Director, Office of Protected Resources,
National Marine Fisheries Service.